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Cells Hindering Transplants Play Wide Role

LYMPHOCYTES are an important class of the white blood cells. They have been much in the news in recent years because sensitized lymphocytes are the agents of destruction of foreign cells and transplanted tissues. Hence a great deal of medical research effort is directed to finding ways of neutralizing lymphocyte ag-

gression by using drugs or antilymphocyte antiserums.

This research is actually far more important to human health than its role in organ transplants would imply. More and more diseases, especially those connected with degeneration and aging, are being discovered to have at least a partial connection with self-agres-

sion. That is, for reasons still poorly understood, the lymphocytes will start to attack some cells of the same individual and ignite such diseases as rheumatic fever, arthritis, nephritis, inflammation of the heart and allergic degeneration of brain cells.

On the other hand, sluggish reactivity of lymphocytes may play a part in allowing tumor cells to gain a foothold and become cancerous. This point has gained dramatic emphasis from the discovery of an alarming incidence of cancer in some transplant patients being treated with certain so-called immunosuppressive drugs, which are compounds that inhibit the lymphocytes.

THE MOST interesting and difficult challenges concern the specificity of lymphocyte aggression, which is closely connected with other kinds of specific immunity, like the production of antibody proteins in the serum. Recent work, however, has begun to throw some light on the mechanism of lymphocyte aggression itself. It has been known for some time that the sensitized cells had to be in direct contact with the target cells, and that in the process both the lymphocyte and the target might be mutually destroyed. What happens after contact has now been clarified, according to experiments reported by Drs. G. A. Granger, T. W. Williams and W. P. Kolb of the University of California (Irvine) in a series of papers in *Nature* magazine and in the

Proceedings of the National Academy of Sciences.

Mixed cells of appropriate combinations release a substance, lymphotoxin, which is responsible for killing the target cells but can also kill cells of other kinds unrelated to the sensitization pattern of the lymphocyte. If lymphotoxin also stimulates the lymphocytes to further growth, for which there is still only indirect evidence, it could help to account for chain reactionlike responses sometimes seen in the development of allergy and immunity.

LYMPHOTOXIN, has been chemically purified only to a limited extent; but it is probably a medium-sized protein which may be synthesized some day. For a long time, however, it will have to be extracted from cells, perhaps in culture.

Curiously, the lymphotoxin from human cells is quite different in its easy destruction by heat from the analogous material from a mouse. Even more interesting, lymphotoxins from different species could be distinguished by the development of specific antibodies in other animals.

If these results can be confirmed, we should soon reach the point of looking for differences in lymphotoxin among different people, which could give us a further important insight into the practical and theoretical problems connected with this aspect of immunity.

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